

## REMARKS

Claims 1-27 were pending in the application. Claims 11-27 were withdrawn from consideration pursuant to a restriction requirement. These claims are canceled.

### *Specification*

The title of the invention was objected to as not descriptive. A more descriptive title is provided.

### *Claim Objections*

Claims 3 and 8 are amended as required by the Examiner.

Claim 9 is also amended as required by the Examiner, except for the objection on page 3, lines 1-2 of the Office Action, referring to the expression “the protruding portion”. Claim 9 does not recite “the protruding portion”. The undersigned assumes that the objection was directed at Claim 10. Claim 10 is amended accordingly.

### *Claim Rejections – 35 U.S.C. 102, 103*

Claims 1 and 3-4 were rejected under 35 U.S.C. 102 over Youmans (U.S. patent no. 3,761,782). Claims 1, 3, 4 and 6-7 were rejected under 35 U.S.C. 102 over Gnadinger (U.S. patent no. 5,229,647). Claim 5 was rejected under 35 U.S.C. 103 over Youmans in view of Baba et al. (U.S. patent no. 5,969,426), and over Gnadinger in view of Baba et al.

**Claim 1** is canceled.

**Claim 3** is re-written as independent, and is amended to recite that “at least a portion of the protruding outer surface extends downward and faces laterally away from the through hole”. This recitation is supported by Applicant’s Figs. 7 and 8. The protruding portion of sidewall 150V of conductor 150 extends downward and faces laterally away from through hole 124.<sup>1</sup>

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<sup>1</sup> The claims are not limited by the embodiments or advantages discussed herein.

Claim 3 is also amended, in the last paragraph, to recite that the bonding material used to attach the protruding outer surface of the conductor to a first substrate provides a conductive bond between the conductor and the first substrate.

This recitation is supported by Applicant's Fig. 8 (solder 420 provides a conductive bond between the protruding surface of conductor 150 and the PCB 410).

Claim 3 distinguishes from the three cited references by reciting that the bonding material "reaches and at least partially covers said portion of the protruding outer surface which is either vertical or sloped outwards". This recitation is supported by Fig. 8. Solder 420 reaches and at least partially covers the protruding outwards-sloping portion of surface 150V. Advantageously, the solder bond is less likely to brake if the die or wafer 104 is pulled upward or sideways (specification, page 6, paragraph 0028).

The Office Action states on pages 3-4 that Youmans discloses a conductor 41 and a bonding material 42. However, Youmans material 42 ("balls 42") in Fig. 10 do not reach or at least partially cover that portion of the surface of conductor 41 which "extends downward and faces laterally away" from Youmans' hole 21 as recited in Claim 3. Balls 42 contact that portion of the surface of conductor 41 which faces laterally towards the hole 21, not away from hole 21. Youmans does not provide a motivation for Applicant's invention.

Gnadinger teaches away from a bonding material because Gnadinger teaches away from forming a mechanical bond between the two wafers. Gnadinger's Abstract states:

Mechanical bonding ... is preferably avoided so that fractures due to thermal expansion differentials will be prevented.

Gnadinger's stack of wafers 10 (Figs. 3, 4) is held together without mechanical bonding by "springs or resilient pads 26" (column 4, line 1). Wafers 10 can thus "move laterally with respect to one another to accommodate the potentially differing thermal expansion" (column 3, lines 58-64).


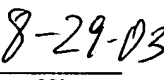
Baba et al. are cited for teaching a "bonding material (41)". However, Baba et al. do not teach or suggest that their material 41 provides a conductive bond as recited in Claim 3. See Baba et al. column 12, lines 62-65, stating:

... 41 is a mold resin encapsulating the semiconductor element 31 and additionally providing the package main body with mechanical strength ...

Claims 4-7 depend from Claim 3.

Claim 2 was objected to. Claim 2 is re-written as independent.

Any questions regarding this case can be addressed to the undersigned at the telephone number below.

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